

GUIDE TO REQUIREMENTS FOR OUTFALL STRUCTURES ON WATER BODIES

December 2004



DISCLAIMER

This document provides a broad overview of Alberta Environment's requirements for outfall structures on water bodies. It does not replace or affect the actual legislative requirements. The person responsible for the outfall structure must follow all the legislated requirements. If there is any conflict between this document and the *Water Act* or its regulations, the *Water Act* and its regulations take precedence.

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INTRODUCTION

Outfall structures and outfall structure activities on water bodies are regulated under the *Water Act* through the *Code of Practice for Outfall Structures on Water Bodies*. The Code of Practice specifies criteria for the construction, maintenance and removal of an outfall structure on a water body. This document is designed to assist those who carry out outfall structure activities on water bodies to understand their obligations.

WHAT ACTIVITIES DOES THE CODE OF PRACTICE APPLY TO?

The Code of Practice applies to activities including placing, constructing, installing, maintaining, replacing or removing an outfall structure on a water body.

An "outfall structure" is defined in Section 1(2)(j) of the Code of Practice as a pipe or structure in, on, under, or adjacent to a water body, that is constructed for the discharge of:

- (i) precipitation that has fallen and been collected, or
- (ii) liquid and water-carried wastes,

to a water body, and includes any associated structure that is required for the installation, maintenance or protection of the outfall structure.

A person who carries out an outfall structure activity must provide notice and carry out the outfall structure activity in accordance with the Code of Practice.

HOW TO PROVIDE NOTICE

Anyone who proposes to carry out an outfall structure activity on a water body must provide notice in writing to the appropriate Director (at Alberta Environment) at least 14 days before starting the outfall structure activity. The notice must comply with the most recent version of the Code of Practice and contain all the information specified in Schedule 1. Copies of the Code of Practice can be ordered from the Queen's Printer by dialing (780) 427-4952 or on-line at <http://www.gov.ab.ca/qp>

To find the appropriate Director for your area contact:

**Alberta Environment
Regulatory Approvals Centre
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, Alberta T5K 2J6
Phone: (780) 427-6311 (first dial 310-0000 to be connected toll-free)**

You can also refer to the Alberta Environment Website to find a regional contact list and map at: www.gov.ab.ca/env/regions

**Procedures to Satisfy
Code of Practice Requirements**

Prepare Plans

- ✓ Professional Engineer Prepares plans
- ✓ A qualified aquatic environment specialist (QAES) provides written specification
- ✓ Submit notification at least 14 days prior to construction



**Undertake Construction Activity &
Report Emergencies**

- ✓ Take photographs
- ✓ Undertake activity using plans & Schedule 3 of Code of Practice
- ✓ Adhere to restricted activity requirements
- ✓ Adhere to recommendations of QAES if applicable
- ✓ Immediately report contraventions of the Code of Practice to Director by dialing 1-800-222-6514
- ✓ Within 30 days of completing measures provide information to Director



Compile and Maintain Records

- ✓ Adhere to the requirements of Section 13 of Code of practice



Monitoring

- ✓ Monitor outfall structure over its lifespan – Section 6 & 14 of the Code of Practice

DETAILS ON SPECIFIC SECTIONS OF THE CODE OF PRACTICE

If a term is used in either the *Water Act* or the *Water (Ministerial) Regulation* and is not defined in the Code of Practice, the definition in the *Water Act* or the *Water (Ministerial) Regulation* applies. If a term is used in either the *Water Act* or the *Water (Ministerial) Regulation* and is defined in the Code of Practice, the definition in the Code of Practice applies.

Code of Practice	DETAILS
Section 1(2)(m)	In complying with the Code of Practice, fish and fish habitat are the primary indicators of the "productive capacity" of the aquatic environment to be considered. In maintaining productive capacity, there must be "no net loss" of productive fish habitat as described in "A Fish Conservation Strategy for Alberta, 1997 – 2007"; see: www.env.gov.ab.ca/internal%5Fsrd/fws/fwmd/index.html
Section 1(2)(o)	A qualified aquatic environment specialist (QAES) may be a private individual, consultant or employee of a company that owns, plans or constructs an outfall structure. The specifications prepared by the QAES under the Code of Practice must include, but are not limited to, mitigation and compensation measures for harmful alteration, disruption and destruction of fish habitat as well as all other aquatic environment. The QAES determines what information and assessments are needed to meet the requirements of the Code of Practice. A QAES must be able to defend and rationalize any specifications they prepare for the person who carries out an outfall structure activity in a water body.
Section 1(2)(u)	A fen, bog, swamp or a muskeg that does not have a defined bed and bank is not considered a "water body" and not regulated by the Code of Practice.
Section 3 Notice to Director	The Director has the authority to change the time within which the notice must be submitted, as well as the content of the notice.

Code of Practice	DETAILS
Sections 5 (1), (2), (3) Notice in Emergencies	During an emergency that makes it impossible to provide advance notice to the Director, the person who carries out an outfall structure activity must take appropriate measures and inform the Director immediately by dialing 1-800-222-6514. Within 30 days of completing measures to resolve the emergency, the person who carries out the outfall structure activity must provide additional information as specified in Section 5 (3) of the Code of Practice.
Section 6 Plans and Schedule 2	The person who carries out an outfall structure activity is required to prepare a plan for the proposed activity before written notice is given to the Director. A plan for an outfall structure must include the information outlined in Section 6(1) and must meet the design and construction standards outlined in Part 1 of Schedule 2. In selecting an outfall structure site and in preparing a plan, the person carrying out an outfall structure activity must comply with other resource and land management requirements such as those under the <i>Public Lands Act</i>.

Code of Practice	DETAILS
Section 7 Maps & Class of water bodies	The class of a water body helps to determine the construction method, and sets out the timing and conditions under which the outfall structure must be constructed, placed, installed, replaced or maintained. The Code of Practice applies to both mapped and unmapped water bodies. The Code of Practice states how the classes of unmapped water bodies must be determined. The class of a water body is determined by the information available about the "sensitivity" of fish habitats and their known distribution. The sensitivity classes of water bodies are: Class A: highest sensitivity - habitat areas are sensitive enough to be damaged by any type of activity within the water body; known habitats in the water body are critical to the continued viability of the fish population species in the area. Class B: high sensitivity - habitat areas are sensitive enough to be potentially damaged by any type of activity within the water body; habitat areas are important to the continued viability of the fish population species in the area. Class C: moderate sensitivity – are broadly distributed habitats supporting local populations of fish species; habitat areas are sensitive enough to be potentially damaged by unconfined or unrestricted activities in the water body. Class D: low sensitivity - fish species as defined under the Code of Practice of Practice are not present. The Code of Practice refers to a distance of 2 km, measured along the stream, when determining the class of uncoded water bodies. For all <u>mapped, unmapped and uncoded</u> water bodies within 2 km of entering a Class A, B, or C mapped water body, the water body takes on the same class as the receiving water body, i.e. will take on the specified Class A, B, or C conditions and construction requirements. For an unmapped water body entering a Class "A" water body with the outfall site further than 2 km from the Class "A" water body, the unmapped water body is Class "B" and takes on the restricted activity period of the nearest mapped Class "B" or "C" water body. For an unmapped water body entering a Class "B" water body with the outfall site greater than 2 km from the Class "B" water body, the unmapped water body is Class "C", and takes on the same restricted activity period of the Class "B" receiving water body.

Code of Practice	DETAILS
Section 9 Construction Methods and Conditions	New outfall structure activity is prohibited in a Class A water body. The Code of Practice notes construction methods and conditions for classes "B", "C" and "D." If the construction method noted is not technically or environmentally feasible, an alternative construction method based on the specifications of a QAES may be chosen.
Section 10 Restricted Activity Period	Restricted activity periods are specified times when outfall structure activities in water bodies are limited. For a Class A water body only the maintenance and replacement of sections of an existing outfall structure is allowed. A QAES must determine the restricted activity period for a Class A water body. Maps under the Code of Practice identify restricted activity periods for mapped Class B and Class C water bodies. Class D water bodies do not have restricted activity periods. If an uncoded water body is a tributary of a Class A, B, or C water body, the 2-kilometre rule applies. Additionally, the presence or absence of fish is used in determining the classifications of unmapped water bodies and their restricted activity periods. The person who carries out an outfall activity must use this rule to determine the applicable restricted activity period. If the outfall structure is to be constructed within a restricted activity period, the specifications or recommendations of a QAES are required.
Section 11 Certification	The information and written specifications for the outfall structures in the plan must meet the required design & construction standards in Part 1, Schedule 2. Upon completion of the outfall structure, the person who carried out the outfall structure activity must certify the structure was completed according to the plans prepared in accordance with Section 6 of the Code of Practice. The person who carries out an outfall structure activity in a water body retains records of the certification until the outfall structure has been removed.
Section 12 Reporting	If there is a contravention of the Code of Practice, the person who carries out the outfall structure activity in the water body must immediately report the contravention as set out under section 12. The person must also submit a follow-up written report within 7 days of the reporting of the contravention.
Section 13 Record Keeping	This section specifies record keeping requirements of the person who carries out an outfall structure activity in a water body.
Section 14 Monitoring	This section specifies monitoring requirements by the person who carries out an outfall structure activity, until the structure has been removed.

Code Of Practice For Outfall Structures on a Water Body
Applicability of
Class Of Water Bodies – Requirements And Options

Water Body Class	Code of Practice Specification	Actions under The Code of Practice	Options provided for Under The Code of Practice
Class "A" Mapped & Coded	• No new structures • Maintenance and replacement of sections of existing structures only	• Replacement of outfall structure sections with discharge of same capacity or smaller • A QAES, with appropriate field assessment, determines timing of activity.	• No other options allowed under the Code of Practice. • Construction methods, as specified by a QAES, may include open methods under conditions where the water body is completely dry or frozen.
Class "B" Mapped & Coded	• New structures • Maintenance and replacement of existing structures	• Isolation method as specified by a QAES and in accordance with Part 3 of Schedule 3 • Restricted Activity Periods	• Isolation method may be determined as being not technically or environmentally feasible. • If so, then move to an open method upon QAES assessment and recommendations. • Construction methods, other than the Isolation method, must be constructed in accordance with the "General conditions for outfall structure activity" (Part 2 of Schedule 3) • Activity within the RAP (restricted activity period) as specified by QAES. • As per the requirements on applicable maps

Water Body Class	Code of Practice Specification	Actions under The Code of Practice	Options provided for Under The Code of Practice
Class "C" Mapped & Coded	• New structures • Maintenance and replacement of existing structures	• Isolation method as specified by a QAES, and in accordance with Part 4 of Schedule 3 • Restricted Activity Periods	• Isolation method may be determined as being not technically or environmentally feasible. • If so, then move to an open method upon QAES assessment and recommendations. • Activity within the RAP as specified by QAES. • Construction methods, other than the Isolation method, must be constructed in accordance with the "General conditions for outfall structure activity" (Part 2 Schedule 3) • Activity permitted within restricted activity periods for water bodies that are dry or frozen to the bed of the water body. • As per the requirements on applicable maps
Class "D" Mapped & Coded	• New structures • Maintenance and replacement of existing structures	• No restricted activity periods	• No restrictions • Construction methods, must be constructed in accordance with the "General conditions for outfall structure activity" (Part 2 Schedule 3) & Part 5 Schedule 3

BEST MANAGEMENT PRACTICES FOR OUTFALL STRUCTURES ON WATER BODIES

All Outfall Structures

To prevent deleterious materials or materials toxic to aquatic organisms from entering a water body, and to prevent the introduction or transfer of weeds and diseases not already found at the site, you must at least:

- (a) inspect equipment and, as necessary, repair equipment to stop any leaks (non-toxic hydraulic fluids such as vegetable based fluids are recommended);
- (b) clean equipment of external grease, oil and other fluids before the equipment enters the water body;
- (c) clean equipment of all mud and dirt before the equipment enters the water body, or the area adjacent to the water body; and before the equipment leaves the area adjacent to the water body upon the completion of work. It is not necessary to clean equipment after the completion of work if the equipment is being moved to another in-stream site on the same water body or a tributary of the same water body;
- (d) store fuel, service and refuel equipment in a manner that prevents fuel and equipment fluids from entering the water body; and
- (e) ensure operators involved in the construction activity are trained and equipped to contain spills or leaks from equipment.

To minimize sediment from entering a water body as required by clause (h), Part 1, Schedule 2 of the Code of Practice you must at least:

- (a) manage the flow of surface and subsurface water in and around the outfall structure during construction;
- (b) immediately install temporary erosion control structures until long-term erosion control measures are fully implemented and functioning;
- (c) stabilize all disturbed areas using measures including, but not limited to, sloping, silt fencing, armouring, installing geotextile fabric blankets, planting of approved seed mixtures or vegetation;
- (d) place excess spoil material where erosion into the water body will be minimized;
- (e) maintain original groundcover vegetation by not grading or grubbing on the banks of the water body and areas adjacent to the outfall structure site, except where required for the trench line;
- (f) prevent silt, and other materials from being carried by water flowing along the trench into the water body. Some methods of erosion control include, but not limited to:
 - (i) ditch blocking and pumping;
 - (ii) de-watering the trench in a manner that prevents erosion and siltation of the water body by discharging into settling ponds or to upland areas in a manner that does not have an adverse effect on any land; and
 - (iii) installing adequate cross and diversion drainage works on portions of the right-of-way that slope to the water body.

Best Practices for Isolation Methods

To help prevent the introduction of sediment and suspended solids into the water body you should at least:

- construct temporary isolation dams,
- pump water from the construction area to settling ponds or to upland areas in a manner that does not adversely affect the land, and
- install the intake of any bypass pump line where it will not disturb sediments in the water body.

To prevent erosion of the area surrounding the outlet of a bypass pump or dewatering pump or flume by dissipating the energy of the released water you may at a minimum use the following devices:

- tarps,
- flip buckets,
- plates, and
- appropriately sized aggregate.

All in stream pumps should have capacities that exceed expected flows. Backup pumps and generators should be on site and operational.

Preparing Contingency Measures

Prepare contingency measures for:

- (a) emergency situations, i.e., equipment failures, adverse weather, flooding, spills, etc.; and
- (b) other occurrences or circumstances that may lead to a deviation from the proposed plan or schedule for completion of the outfall structure activities.

Where appropriate, identify contingency measures including:

- (a) alternative outfall structure installation methods, and
- (b) procedures and back-up measures for possible emergency situations.

Outfall Structure Site Monitoring

Conduct monitoring as required under the Code of Practice to include, but not limited to:

- (a) monitoring during isolation and open methods to assess immediate effects of the outfall structure activity on the aquatic environment; for example, measuring sediment release;
- (b) post-construction monitoring to assess the condition of the outfall structure site and effectiveness of physical and other measures taken.

Monitor the effect of the activity on the aquatic environment during construction. The monitoring should be carried out:

- (a) when outfall structures are located in a highly sensitive aquatic environment, for example, a Class A water body;
- (b) at a site where an isolation or presumably open method is used in a Class B water body,
- (c) at a site where presumably an open method is used in a Class C water body.

The intent of the monitoring is to quantify the effects of the outfall structure activity for the purpose of identifying additional measures that must be carried out for the outfall structure activities to meet clause (a), Part 1 of Schedule 2. The monitoring should be designed and conducted by a QAES.

In order to meet the requirements of Section 14, conduct post-construction monitoring of the outfall structure site at least annually during the snow-free season. Inspect the site more frequently, especially after high stream flow events. Also, conduct post construction monitoring to assess:

- (a) the physical condition of the outfall structure site,
- (b) slope/bank stability,
- (c) erosion control measures,
- (d) physical integrity of restoration measures, etc.

Post construction monitoring required under the Code of Practice does not replace outfall structure monitoring programs required under other statutes and regulations, and can be conducted in conjunction with other monitoring programs where appropriate.

Preparing Aquatic Environment Assessments

1. In addition to the information required in clause 1(1)(d) of Schedule 4, note the following features:
 - (a) areas of streambed groundwater upwelling and stream bank seepage,
 - (b) barriers to fish movement,
 - (c) identification of other physical activities or natural disturbances which may have impacted the outfall structure site,
 - (d) surrounding land use activities and description of surrounding terrain,
 - (e) other environmental features or values the outfall structure activities may adversely affect.
2. A QAES should consider the following factors in describing the anticipated effects of the outfall structure activity on a water body:
 - (a) the effects of disturbance on streambeds, stream banks and riparian areas at, and adjacent to, the water body;
 - (b) the extent (zone of impact) of downstream sediment transport and sedimentation resulting from the outfall structure activity;
 - (c) the effects of sediment transport and sedimentation on aquatic biota and fish habitat.
3. The specifications of the QAES, required to meet clause (a), Part 1 of Schedule 2, must include, but are not limited to, descriptions of sediment control measures and fish habitat restoration measures.
4. In some areas a QAES may consider the existing fish and fish habitat data and information to be insufficient to complete an assessment of the potential effects of the outfall structure activity on the aquatic environment. In that case the QAES may use the following methods, where possible, to design and conduct field assessments at the outfall structure site:

(a) **Study Sections** – Establish a minimum of two study sections for the purpose of conducting physical and biological assessments as follows:

- (i) one, a minimum length of 100 metres, immediately upstream of the proposed outfall structure site;
- (ii) one, a minimum length of 300 metres, or encompassing the entire zone of impact, whichever is greater, consisting of the outfall structure site and the area downstream of the outfall structure site; and
- (iii) establish additional study sections either upstream or downstream of the zone of impact as needed to determine the presence of fish species that could be potentially affected by the outfall structure activity.

(b) **Physical Assessment** - Conduct this assessment to determine water body conditions, and characterize fish habitat in the study sections immediately upstream of the outfall structure site, including the zone of impact.

- (i) **Determining the zone of impact** - For the purpose of this assessment, the zone of impact is defined as the area of the water body where 90% of the sediment discharged as a result of the outfall structure activity will be deposited. Conduct substrate sampling, if needed, to determine the zone of impact, and any potential adverse effects of the outfall structure activity on the aquatic environment.
- (ii) **Physical assessment methods and parameters** – Conduct one assessment of the upstream study section, and the zone of impact study section before commencing the outfall structure activity. State the date on all data sheets. Map the types and location of fish habitat in both study sections as part of the physical assessment using an accepted habitat classification system. Identify and document the habitat mapping types and cover composition to include:
 - ◆ cover provided by surface turbulence
 - ◆ aquatic vegetation
 - ◆ in stream cover
 - ◆ terrestrial canopy
 - ◆ rock/boulder substrates
 - ◆ under-cuts
 - ◆ turbidity
 - ◆ cover provided by depth
 - ◆ pool/riffle/run ratio

To complement the habitat mapping, establish a minimum of five cross-sectional transects across the two study sections. Locate two transects upstream of the outfall structure site; one at the outfall structure site, and a minimum of two in the zone of impact. Record the following information for the habitat mapping:

(i) **At the outfall structure site**

- ◆ water velocity and discharge
- ◆ four photos at the proposed right-of-way transect; one of each bank taken from the opposite bank, one looking upstream of the outfall structure site, and another looking downstream.
- ◆ water quality parameters
- ◆ water temperature, date and time of reading
- ◆ pH, conductivity, dissolved oxygen, turbidity

(ii) **At each transect within each study section**

- ◆ bank full width and wetted width
- ◆ water depths at 0.25, 0.5, and 0.75 metres of the wetted width
- ◆ water velocity
- ◆ bottom types
- ◆ % fines, gravel, cobble and boulder
- ◆ description of both banks of the water body
- ◆ height, slope, stability

- (c) **Biological Assessment** – In this assessment determine the current presence/absence of fish in the water body at each study section. To account for seasonal variation, conduct the biological assessment once in spring, and once again in fall. Also conduct the assessment during the period when anticipated impacts of the outfall structure activity on fish species' life stages, such as spawning and egg incubation, are best documented.

For the biological assessment:

- (i) record the length of the study section
 - (ii) sample the entire length of the study section by using electro fishing. Record the number of fish caught each time electro fishing was applied. Record the type of equipment used and the number of seconds electro fishing effort was applied. You may use other active and passive fish capture methods to augment electro fishing where required.
 - (iii) record all fish species captured, the number of each species and the location or habitat types where fish were captured
 - (iv) record the fork length and weight of all sport fish species captured
 - (v) record the gender and maturity of sport fish species if externally determinable
 - (vi) note spawning potential
 - (vii) note, any evidence of spawning activity (redds, fish on redds, etc.), during restricted activity periods and determine where possible the presence of fish and fry at the outfall structure site.
5. A QAES must obtain a license for fish research from Fisheries Management, Alberta Sustainable Resource Development, prior to collecting fish data for field assessments. As part of the license requirements, the specialist will be required to provide a copy of field data and reports to the Fisheries and Wildlife Management Division in a format specified in the license. Field data and reports provided to Fisheries Management are available to the public upon request.

Direct any comments, questions, or suggestions regarding the content of this document to:

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If you have any questions or would like more information, contact your local Alberta Environment office. For toll free access, dial 310-0000 from anywhere in Alberta.

APPENDIX

List of legislated documents that set out proponents' requirements and obligations for environmental protection at the outfall structure site, are the:

- *Water Act*
- *Water (Ministerial) Regulation*
- *Public Lands Act*
- *Environmental Protection and Enhancement Act (EPEA)*
- *Fisheries Act (Canada)*
- *Navigable Waters Protection Act (Canada)*